Savannah River Site
Citizens Advisory Board

Recommendation #295
Implementation of Spent Nuclear Fuel Exchange Program with Idaho

Background

The receipt of spent nuclear fuel (SNF) from foreign and domestic reactors is an ongoing program at SRS and has been for many years. Current planning indicates that such shipments will continue for a number of years in the future. Much of the spent nuclear fuel has highly enriched uranium (HEU).

These HEU material receipts will be stored in the L Basin pool, built in 1956, along with some existing used fuel assemblies that began arriving in the facility in 1996 as part of the National Nuclear Safety Administration's Global Threat Reduction Initiative. At this point approximately 22,000 positions will be ultimately filled and awaiting disposition when disposition decisions and implementation are carried out. Most (approximately 90%) of the spent nuclear fuel (SNF) which will ultimately come to SRS (or is already here at SRS) has aluminum cladding and is considered aluminum-based fuel and can be processed in the SRS H-Canyon with the HEU recovered for reuse and the waste sent to the Defense Waste Processing Facility for disposition in the SRS Waste Canisters.

However, approximately 10% of the SNF in the SRS Storage Basins is not amenable for processing in H-Canyon and must be processed in a different manner for ultimate disposal. At one time DOE had considered the concept of removing non-aluminum based spent nuclear fuel from SRS to the Idaho DOE Site. The Idaho Site was, in turn, to send aluminum based spent nuclear fuel to SRS. This concept offers the advantage of removing from SRS SNF that cannot be processed in H-Canyon. It also offers the advantage of bringing in its place SNF that can be processed at SRS. Further, the political issues of waste location and movement have been partially addressed, and does result in “waste-neutral” exchanges between the two states.

It is not clear at this point how this SNF will be ultimately dealt with from a disposition standpoint. The decision on how to proceed in this matter is part of the larger picture on how DOE will dispose of such SNF in light of the Blue Ribbon Committee Report recommendations issued in January 2012. The Citizens Advisory Board has expressed strong support for processing the SNF through H-Canyon to recapture the remaining HEU for reuse in nuclear power plants and processing the waste in the Site Liquid Radioactive Waste Program, which is a well-established and controlled disposition pathway.

Discussion

While at this point there is still no approved disposition path for the SRS spent nuclear fuel. However, having the SNF at SRS be 100% aluminum clad strengthens the case for processing of

SNF through H-Canyon since all of the SNF would be aluminum based. In the past the CAB has strongly supported processing of the aluminum-based SNF (approximately 90%) through the H-Canyon. The increased HEU from this additional 10% increase would improve the economy of scale. It would also make less necessary considerations for extended storage using the dry storage concept.

From the standpoint of DOE this would make possible the disposition of all aluminum based SNF in an acceptable, proven manner using H-Canyon processing capability. It would permit removal of all SNF from SRS in timely, economical manner.

Recommendations:

The Savannah River Site Citizens Advisory Board recommends that DOE:

1. Conduct an economic study to determine the feasibility of reinstituting the Spent Nuclear Fuel Exchange Program with Idaho to include:
    a. Evaluating both the upfront and overall costs of transportation and processing in H-Canyon vs. extended storage and disposition of SNF by some other means.
    b. Assessing other challenges such as gaining political approval, capital funding for needed shipping facilities and containers, etc.
2. Re-examine the economy of processing SNF through H-Canyon considering that additional HEU will be recovered and made available for reuse by the commercial power industry.
3. Re-examine the advantage of having all SNF processed at SRS and not held for extended storage at SRS.
4. Provide the information developed from this study to HQ and attempt to have this information factored into the HQ evaluation of processing SNF as a disposition option for SNF.

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Adopted September 25, 2012
Sponsored by the Nuclear Materials Committee